

Claims

1. A formwork system comprising formwork elements (16, 17) which have mutually oppositely disposed formwork inner surfaces (19, 20) and can be connected to one another spaced apart from one another by means of formwork ties, wherein a formwork tie consists of a bolt element (1) and two locking elements (2, 3) which, in the two mutually remote end regions of the bolt element (1), can be coupled to it and are formed for the transmission of tensile forces from the formwork elements (16, 17) onto the bolt element (1), characterized in that the locking elements (2, 3) have coupling elements (9, 10) for the transmission of compressive forces from the formwork elements (16, 17) onto the bolt element (1).
2. A formwork system in accordance with claim 1, characterized in that the mutually oppositely disposed formwork inner surfaces (19, 20) are each formed by a group of individual formwork elements (16, 17), with each group of formwork elements (16, 17) each having tie holes (18), in particular circular tie holes, for the reception of the bolt elements (1) of the formwork ties.
3. A formwork system in accordance with any one of the preceding claims, characterized in that the locking elements (2, 3) each have a tensile force transmission surface (21, 22) cooperating with the respective outer side of the formwork elements (16, 17).
4. A formwork system in accordance with claim 2 and claim 3, characterized in that the region of the outer side of the formwork

elements (16, 17) surrounding the tie holes (18) are made to cooperate with the tensile force transmission surface (21, 22).

5. A formwork system in accordance with any one of the preceding claims, characterized in that undercuts (23, 24) are provided at the outer sides of the formwork elements (16, 17) and can be brought into active connection with compressive force transmission surfaces provided at the coupling elements (9, 10).
- 10 6. A formwork system in accordance with claim 5, characterized in that the coupling elements (9, 10) are hook-shape in cross-section so that they can be hooked with the undercuts (23, 24) of the formwork elements (16, 17).
- 15 7. A formwork system in accordance with any one of the preceding claims, characterized in that the locking elements (2, 3) each have a substantially parallelepiped shaped housing (4, 5) at which the coupling element (9, 10) is shaped.
- 20 8. A formwork system in accordance with claim 7, characterized in that the parallelepiped-shaped housing (4, 5), including the coupling element (9, 10), is manufactured by means of an extrusion method or rolling or roller method, and is open at two oppositely disposed sides which extend perpendicular to the formwork surfaces (19, 20).
- 25 9. A formwork system in accordance with any one of the preceding claims, characterized in that the one locking element (2) is captively connected to the bolt element (1) and the other locking element (3) is releasably connectable to the bolt element (1).

10. A formwork system in accordance with claim 9, characterized in that the bolt element (1) is rotatably journaled around its longitudinal axis in the locking element (2) fixedly connected to it.
- 5    11. A formwork system in accordance with any one of the claims 9 or 10, characterized in that the bolt element (1) projects on the side remote from the tensile force transmission surface (21, 22) out of the locking element (2) fixedly connected to it and is provided in this projecting region with a contact surface (11) for a tool, in particular with a square or a hexagon.
- 10    12. A formwork system in accordance with any one of the claims 9 to 11, characterized in that the bolt element (1) is provided at its end region remote from the locking element (2) fixedly connected to it with a thread for screwing into the locking element (3) releasable from the bolt element (1).
- 15    13. A formwork system in accordance with any one of the preceding claims, characterized in that the bolt element (1) is conical.
- 20    14. A formwork system in accordance with claim 13, characterized in that the thread in accordance with claim 12 is provided at the thinner end region of the conically formed bolt element (1).
- 25    15. A formwork system in accordance with any one of the claims 9 to 14, characterized in that the locking element (3) releasable from the bolt element (1) is provided with a thread sleeve (12) into which the bolt element (1) can be screwed, with the external diameter of the thread sleeve (12) being dimensioned approximately like the internal

diameter of the tie holes (18) formed in the formwork elements (16, 17).

16. A formwork system in accordance with claim 15, characterized in that the length of the section of the thread sleeve (12) projecting out of the locking element (3) is dimensioned such that it extends at least over the total thickness of a formwork element (17) cooperating with the locking element (3).  
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- 10 17. A formwork system in accordance with any one of the claims 15 or 16, characterized in that the thread sleeve (12) is captively connected to the locking element (3) associated with it.
- 15 18. A formwork system in accordance with any one of the preceding claims, characterized in that a locking block (6, 7) is held in the housing (4, 5) in accordance with claim 7 and is releasably connectable or fixedly connected to the bolt element (1).
19. A formwork system in accordance with claim 18, characterized in that the locking block (7) of the one locking element (3) is fixedly connected to the thread sleeve (2) in accordance with any one of the claims 15 to 17, whereas the bolt element (1) is rotatably journaled around its longitudinal axis in the other locking block (6).  
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- 25 20. A formwork system in accordance with any one of the preceding claims, characterized in that the housing (4, 5) in accordance with claim 7 is provided with mutually aligned bolt holes (13, 14 at mutually oppositely disposed sides.

21. A formwork system in accordance with claim 20, characterized in that the bolt holes (13, 14) each have the shape of a curved elongate hole in which the bolt element (1) and/or the thread sleeve (12) in accordance with any one of the claims 15 to 17 are displaceable.